European
MARINE BOARD
Advancing Seas & Ocean Science

6TH EUROPEAN MARINE BOARD FORUM

IMPLEMENTING THE UN 2030 AGENDA
What role for marine science?

6 December 2017, Brussels, Belgium

PROCEEDINGS

"We need science to help the Ocean so that it can support the UN 2030 Agenda."

Peter Haugan, University of Bergen, Norway

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European Marine Board profile

European Marine Board provides a pan-European platform for its member organizations to develop common priorities, to advance marine research and to bridge the gap between science and policy, in order to meet future marine science challenges and opportunities.

The European Marine Board was established in 1995 in association with the European Science Foundation (ESF), and in January 2017 it became a fully independent legal entity under Belgian Law. It facilitates enhanced cooperation between European organizations involved in marine science (research institutes, research funding bodies and nationally-based consortia of Universities and third-level institutes) towards development of a common vision on the research priorities and strategies for marine science in Europe. In 2017, the European Marine Board represents 33 member organizations from 19 countries.

The European Marine Board provides the essential components for transferring knowledge from the scientific community to decision makers, promoting Europe's leadership in marine research and technology. Adopting a strategic role, the European Marine Board provides a unique forum within which marine research policy advice to national agencies and to the European institutions is developed, with the objective of promoting the establishment of a European marine Research Area.

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KEY MESSAGES FROM THE 6TH EUROPEAN MARINE BOARD FORUM

Marine science to support the UN2030 Sustainable Development Goals 6th EMB Forum Message

Seas and Ocean[1] are fundamental to life on Earth. Human impacts on our seas and Ocean are increasing and yet they remain the most poorly studied environments on Earth that continue to yield discoveries new to science and society.

Our seas and Ocean are largely governed through a fragmented patchwork of voluntary international agreements. Globalisation and increasing demand is driving exploitation of marine resources on an unprecedented scale. In response, there is an overriding need for science to inform the economic, environmental and societal context of related policy development and implementation. The UN 2030 Agenda for Sustainable Development[2], with its 17 Sustainable Development Goals (SDGs), provides a globally significant opportunity to focus scientific effort on delivering the knowledge and expertise required to underpin sustainable development in our seas and Ocean. SDG 14 refers specifically to the need to conserve and sustainably use the Ocean, seas and marine resources for sustainable development, but it is understood that the marine environment underpins about 60% of all SDGs. Co-ordinated scientific effort is fundamentally important to understanding and tackling these multiple and complex challenges.

The 6th European Marine Board Forum[3] was held on 6th December 2017 in Brussels to discuss Implementing the UN 2030 Agenda and the role for marine science in this endeavour. Over 150 representatives from marine science organizations, NGOs and Government registered to attend the event. World leading authorities provided presentations and participated with delegates in discussions exploring the role of science in contributing to the sustainable development of our seas and Ocean.

Key messages

During the Forum it was announced by the Executive Director of the Intergovernmental Oceanographic Commission of UNESCO that the General Assembly of the United Nations has formally supported an International Decade of Ocean Science for Sustainable Development 2021-2030, and the Intergovernmental Oceanographic Commission of UNESCO received the mandate to work together with all ocean stakeholders to develop a common Implementation Plan for the UN Decade of Ocean Science. This decade represents both a huge opportunity and a challenge to the marine science community. The preparations during the coming three years must be used to develop initiatives designed to ensure that marine science is aligned with and actively contributes to the achievement of the SDGs during the Decade of Ocean Science.

[1] http://oceanliteracy.wp2.coexploration.org/
[2] http://www.un.org/sustainabledevelopment/development-agenda/
[3] http://marineboard.eu/6th-marine-board-forum

To this end, Forum participants highlighted the need to support:

- **Science integration** through multi-disciplinary, collaborative and holistic approaches to marine science,
  taking in account ecosystem-based and precautionary approaches.
- **Scientific capacity building** through more effective training, knowledge exchange and technology transfer both locally and globally.
- **Science engagement with society** to promote better understanding of the marine environment,
  the role marine science can play in in helping to inform decision makers and the need to engage
  relevant stakeholders in defining scientific priorities.
- **Science-based societal debate** on how best to develop governance of our seas and Ocean using science to inform the development of policy, law and sustainable economic development.

In response to these key messages, the European Marine Board is committed to:

1. Helping support **ocean assessment** efforts with the best available science.
2. Helping support the transparent, systematic collection of **openly accessible data and observations.**
3. **Strengthening institutional frameworks** and specifically, encouraging the Intergovernmental Oceanographic Commission (IOC) to become the lead advocate for ocean science and assessment in the United Nations.
4. Actively supporting preparations for the planned **United Nations Decade of Ocean Science in Support of Sustainable Development.**
5. **Facilitating informed dialogue** through the publication of authoritative marine science and ocean governance briefing documents designed to meet the needs of key stakeholders and decision makers.
6. Using the flagship European Marine Board ***Navigating the Future*** publication series to highlight research needs. Navigating the Future V, to be published in 2019, will include recommendations for high-impact and visible contributions by the European marine scientific community to the Decade of Ocean Science.
7. Contributing recommendations for marine graduate education and training needs in the context of SDGs by building upon its forthcoming publication: **Training the 21st Century Marine Professional- A new vision for marine graduate education and training programmes in Europe.**
8. **Facilitating the provision of scientific advice** to decision makers as part of the marine scientific community's contribution to the UN 2030 Agenda.


SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD

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The 6th European Marine Board forum

EUROPEAN MARINE BOARD FORUM SERIES

The European Marine Board Forum brings together European marine research stakeholders, representatives of the marine science community, funding agencies and national and European science institutions, to advance research and to promote marine science in Europe and globally. In line with this objective, the European Marine Board Forum provides a platform for European Marine Board members, partner organizations, individual scientists and European and national policymakers to interact on a particular topic or theme of strategic importance to:

- Provide a focal meeting point for discussion among individual scientists, policymakers and other relevant stakeholders;
- Facilitate the exchange of information and ideas and agree a common position;
- Enhance collaboration and reduce fragmentation and/or duplication in the European research effort.

The main messages, discussions and decisions from European Marine Board fora are recorded and published as proceedings. Presentations and outputs of the five previous European Marine Board fora are available on the European Marine Board website: www.marineboard.eu/forum

The **1st Forum in 2008** ***(Marine Data Challenges: from Observation to Information)*** brought together representatives of some of the key European marine observation and data centres, researchers, national and European policymakers and data end-users from the maritime and offshore industries. The Forum's discussions contributed to the development of the European Marine Observation and Data Network (EMODnet) initiative launched by the European Commission. Furthermore, the Forum led to a joint Marine Board – EuroGOOS publication on EMODnet.

The **2nd Forum in 2010** ***(Towards a European Network of Marine Observatories for Monitoring and Research)*** emphasized the need for long-term time series data, which can best be provided by a coherent European network of marine observatories to support monitoring and research. These form a crucial component of the ocean observing system and the original end-to-end EMODnet.

The **3rd Forum in 2012** ***(New Technologies for a Blue Future)*** highlighted innovation hotspots for the European marine sector, showcasing emerging technologies for driving growth, novel applications for human wellbeing and tools for next generation marine knowledge.

The **4th Forum in 2014** ***(Arctic 2050: Towards ecosystem-based management in a changing Arctic Ocean)*** discussed how to best manage the consequences of a changing Arctic Ocean. It highlighted the need for industry and science to work together, to contribute to sustainable management of the Arctic Ocean by providing data for mitigating the impacts and addressing the opportunities posed by current environmental changes in the region.

The **5th Forum in 2015** ***(The Ocean Climate Nexus: The critical role of ocean science in responding to climate change)*** promoted awareness of the role of the Ocean in climate regulation and global change, identifying priorities for future research and making recommendations to policy makers. The event was certified with a COP21 label.

All documents and materials from the 6th Forum are available online at:
http://www.marineboard.eu/6th-marine-board-forum

6TH EUROPEAN MARINE BOARD FORUM
Programme

Moderator: Quentin Cooper, BBC Science Journalist, UK

09.00 **Registration and welcome coffee**
09:30 – 09:40 **Welcome, Jan Mees**, Chairman, European Marine Board
09.40 – 10.00 **Opening address, Hélène Clark**, DG Maritime Affairs and Fisheries
10.00 – 10.30 **Keynote address, Joyeeta Gupta**, University of Amsterdam, The Netherlands

Session 1. The Ocean and the UN 2030 Agenda Rapporteur: Mark James, EMB vice-chair, MASTS, UK		
10.30 – 10.45	***The UN 2030 Agenda***	**Vladimir Ryabinin**, Intergovernmental Oceanographic Commission - UNESCO
10.45 – 11.00	***The Global Ocean Science Report***	**Luis Valdés**, Instituto Español de Oceanografía (IEO), Spain
11.00 – 11.30	***Networking and coffee***	
Session 2. Ocean science needs for implementing the SDGs Rapporteur: Gilles Lericolais, EMB vice-chair, IFREMER, France		
11.30 – 11.45	***The science perspective***	**Martin Visbeck**, GEOMAR, Germany
11.45 – 12.00	***The legal perspective***	**Seline Trevisanut**, Utrecht University, The Netherlands
12.00 – 13.00	***Panel discussion***	**Seline Trevisanut**, Utrecht University **Martin Visbeck**, GEOMAR **Samantha Burgess**, WWF **Lauren Weatherdon**, UNEP-WCMC **Iván Lopéz**, Europêche **Ana Teresa Caetano**, DG RTD
13.00 – 14.30	***Group photograph, followed by lunch***	
Session 3. Strengthening the evidence base for international ocean governance: the key role of marine science Rapporteur: Jan-Stefan Fritz, EMB vice-chair, KDM, Germany		
14.30 - 14.45	***COST Action: Ocean governance for sustainability: challenges, options and the role of science***	**Maria Hadjimichael**, University of Cyprus, Cyprus
14.45 – 15.30	***Panel discussion***	**Maria Hadjimichael**, COST Action **Peter Haugan**, University of Bergen **Murray Roberts**, University of Edinburgh **Ann Dom**, Seas at Risk **John Brincat**, DG MARE **Ann-Katrien Lescrauwaet**, VLIZ
15.30 – 16.00	***Key Forum Messages:*** Wrap-up by Session Rapporteurs	
16.00	***Reception***	

Moderator's Introduction

Quentin Cooper, (BBC Science Journalist, UK) opened the 6th EMB Forum and welcomed the participants to the event. He set the scene for the discussions to come, and outlined the purpose of such an event at such a time. He spoke about phrases such as "my bounty is boundless as the Ocean" and "there's plenty more fish in the sea", phrases which are ingrained into our everyday language, but which are now giving a false impression of the Ocean having limitless resources. In reality, he said, we are in the middle of a planetary crisis. The challenge now is not to find out in which direction we need to go, but to get others from beyond marine science on board in moving forwards towards solutions. He explained that this Forum event is designed to encourage and accelerate this interaction with the wider stakeholder community.

Welcome

Jan Mees (European Marine Board Chair, Flanders Marine Institute, Belgium) welcomed the participants and introduced the European Marine Board. He outlined the concept of the EMB biannual Fora to the participants and highlighted the topics of previous Forum meetings. He noted that this meeting will reflect on marine science and its role in ocean governance. He mentioned the important and timely nature of this discussion. He explained that the ultimate goal is to break down the boundaries between the different sciences disciplines, and foster dialogues with wider stakeholder groups.

Opening Address

Hélène Clark (European Commission Directorate-General for Maritime Affairs & Fisheries) highlighted the importance of integration and cross-collaboration, and noted how in this, science is key. She stated that the Ocean is central to sustainable development and around 60% of the SDG targets are linked to the Ocean. Fit-for-purpose governance, including cross-territorial and sectoral holistic approaches are needed, rather than more traditional silo-based decision-making. The European Commission want to ensure that they have informed policy and hence it relies on science in the form of technology, knowledge, innovation, jobs, growth in existing and emerging areas. She noted that Europe wants to lead the transition to sustainable blue growth. She stated that future research priorities will be guided by the UN 2030 Agenda, and that the European Commission will reach out to relevant stakeholders to jointly define an agenda for future marine and maritime research. She also made reference to the recent Lamy Report[4] and the Bohemia Report[5] as guides for moving forward.

[4] http://ec.europa.eu/research/evaluations/pdf/archive/other_reports_studies_and_documents/hlg_2017_report.pdf
[5] https://ec.europa.eu/research/foresight/index.cfm?pg=strategic

Keynote Address - Sharing Our Earth with Special Reference to Marine Ecospace

Joyeeta Gupta (University of Amsterdam, The Netherlands) presented a keynote address on the subject of ecospace.

She explained that at present there are fixed resources but rising demands, and explained that her presentation will explore the rules by which their use can be governed. A sustainable use of resources and ecosystem services requires adequate cross-boundary management of those services. This means that there needs to be a reallocation of the fixed resources worldwide. The minimum needs of each group need to be assessed and there should be a more just allocation of the different rights and responsibilities, the risks and burdens.

She explained that the difficulty lies in establishing who should make these decisions and allocations. She outlined the different approaches which can be used to govern under scarcity:

1. **Normal Economical Procedure** (neo-liberal capitalist approach) whereby resources are turned into commodities. Privatization and typically confidential contracting of former "public" goods can lead to a "grabbing" culture. If this approach were to work in favour of sustainability, the market would need to obey a hierarchy of rules on a global scale and there could be no confidentiality.
2. **Hegemonic Power Approach** where bilateral treaties are made between countries to gain access over resources that are restricted due to national boundaries. The Governments both issues exploitation rights and negotiate to share the burdens, costs and required actions. However, this approach relies on agreements being reached, and the longer they are not, the worse the problems being faced will become. The sovereignty of countries makes it difficult for this approach to work, especially given the problems currently faced by the Ocean.
3. **Polycentric Governance** with multilevel actors above the national states, and with self-managing communities in which they can mobilize different actors/communities is proposed as the best solutions given that it could lead to sustainable development with a global constitution. However, it may already be too late.

She explained that the best solution for deciding how to share the limited resources available may be to make sure that there is social inclusion and ecological inclusion with an internalization of impacts on ecosystems by a common resource control and an adaptive governing system which takes into account the different ecosystem service functions with transparent contracts and investments.

"I think that the relationship between the Ocean and governance on land is very important; and there is more need to also look at the Ocean not just from a European perspective but from a global perspective."

Joyeeta Gupta

SESSION 1
The Ocean and the UN 2030 Agenda

The UN 2030 Agenda

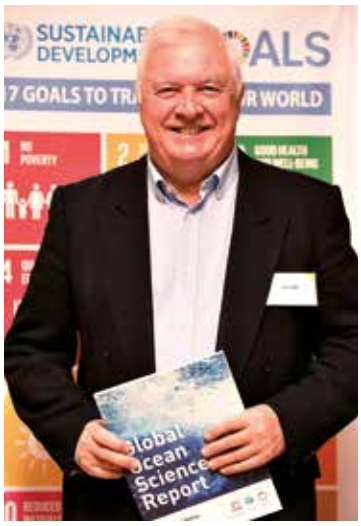
Vladimir Ryabinin (Intergovernmental Oceanographic Commission of UNESCO) outlined the recent activities that have taken place in relation to the UN 2030 Agenda.

He noted that it is not possible to discuss ocean science without discussing the world, as this is a global issue. He introduced the Sustainable Development Goals (SDG's), noting that at present these remain quantitative goals but that the strategy for implementation is not yet clear. It is for science to help policy in providing the required knowledge and understanding to translate these into realistic and implementable actions and then to find sustainable solutions, to move towards achievement. He noted that we now have a leader for the Ocean in the form of UN Special Envoy for the Ocean, Peter Thomson, and mentioned the SDG14 Conference which was held in New York in Summer 2017, informing the participants that talks are already taking place for a possible second conference in 2020.

Vladimir informed the participants that the UN General Assembly was sitting at the same time as the Forum event was taking place, and that it has been decided to formally adopt the IOC Decade of Ocean Science for Sustainability proposal in a UN resolution. This Decade, which has a tagline "The Ocean we need for the future we want", will begin in January 2021 and will be a breakthrough in our ability to achieve sustainability. He hoped that it would raise not only the profile of science but also the demand for it. He thanked fellow Forum participants Peter Haugan and John Brincat for their crucial roles in achieving this UN resolution.

"The Decade of Ocean Science for Sustainability will be all-inclusive and will raise the profile of marine science globally. It will also increase the demand for science"

Vladimir Ryabinin



The Global Ocean Science Report

Luis Valdés (Instituto Español de Oceanografía, Spain) introduced the Global Ocean Science Report, which was published earlier in 2017.

This is the first report of its kind and it aims to strengthen international ocean science collaboration. He then presented some of the key findings from the report, noting that global ocean science is "big science" and should be treated as such.

Luis then presented overviews on some of the topics covered in the report, including gender balance in marine science, infrastructure such as marine stations and research globally, the production and publication of ocean science, science specialization in different parts of the world, scientific research collaboration and organizations supporting science. He particularly noted that in Europe, there would need to be an increase in scientific publications of 35% every 5 years for Europe to maintain its current standing globally. Using the findings presented in the report, he outlined some key calls for action to ensure the advancement of ocean science globally.

He closed by noting that an additional call for action to the Global Ocean Science Report should be included relating to ocean governance, and the need for clarification and faster decision-making, meaning that scientific knowledge needs to move much faster from scientific community to relevant stakeholders and the general public.

"Ocean science must be seen as 'big science' and therefore requires international stewardship to empower society, sustain the environment and generate knowledge to support ocean management and develop useful products, services and employment."

Luis Valdés

SESSION 2
Ocean science needs for implementing the SDGs

The science perspective

Martin Visbeck (GEOMAR) gave a presentation on #oceanoptimism and his thoughts on how we should organize our Ocean and our science.

Martin noted that although we now have the SDGs and indicators to support these, for many it is not yet clear whether these are indeed the best indicators and how we should measure progress towards achieving them. The role of science should be to propose appropriate and scientifically robust indicators and approaches for measurement. The solution lies in innovation, integration and observation. He mentioned the importance of projects such as the ongoing AtlantOS Project which is looking at supporting *in situ* observations which could support the science for indicator development.

He then discussed the SDG's further, highlighting how indivisible and interconnected they are. In a recent study, they looked at the policy coherence of 97 interactions at target level: 61 (positive), 1 (neutral) and 35 (negative)[6]. Due to this very interconnected nature, in order to move towards achieving these goals, science needs to move away from "one silo" thinking and implementation, and cross boundaries towards trans-disciplinary approaches to research and innovation. He presented examples of exciting collaborations between science and the technology industry, most recently Google, which use deep learning techniques to analyze existing data to provide scientific knowledge and applications with societal and policy relevance, citing these as areas which science should explore further.

The main message of Martin's presentation was to highlight the need for the sciences to link up and work together with joined-up agendas, to provide solutions that are beneficial for both science and society.

"There is a need for more integration in the Ocean: from ocean science, to ocean observation, to ocean assessment to ocean governance. There is also a need for more communication, global learning and Ocean Literacy: Without Ocean Literacy the will to act will remain weak."

Martin Visbeck

[6] https://www.icsu.org/cms/2017/05/SDGs-Guide-to-Interactions.pdf

The legal perspective

Seline Trevisanut (Utrecht University) provided a legal perspective on the UN 2030 Agenda and interaction with marine science.

Seline opened her presentation by recalling the last target for SDG14, which is to "Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources". What does this mean from a legal perspective? It is vital that this question is answered as implementation requires a legal basis.

Seline noted that UNCLOS contains more than 300 articles and therefore is very large and complex. She noted that it would be beneficial going forwards if more scientists had a working knowledge of this legal framework and its complexities as this would improve understanding and collaboration. The reverse should also be encouraged, with legal experts introduced to the basic principles and concern in marine science, and the scientific basis for these legal requirements. She also explained the difficulties that legal frameworks such as UNCLOS can present. Governments must abide by not only UNCLOS requirements, but also by other international, economic, energy and environmental laws which are in force, and in some cases, these can cause contradictions. This can make it very difficult for policy makers to be clear which requirements and regulations apply for specific activities.

It is therefore important to highlight gaps and limits in the UNCLOS framework that others can fill. There also exist Rules of Reference for the Law of the Sea convention that can be used to give legal effect to recommendations which are made globally. Through these, principles such as "polluter pays", the "precautionary principle" and the "ecosystem approach" have been brought into this legal framework. She concluded by noting that we do not need new conventions; instead we need to seek greater clarity, understanding and implementation of those that already exist.

"There is a need to improve the way in which the stakeholders communicate. The lack of a common language or of a common understanding undermines the effectivity of the exchange."

Seline Trevisant

Panel discussion

Samantha Burgess (World Wildlife Fund), Seline Trevisanut (Utrecht University, The Netherlands), Martin Visbeck (GEOMAR, Germany), Lauren Weatherdon (United Nations Environment Programme - World Conservation Monitoring Centre), Iván Lopéz (Europêche), Ana Teresa Caetano (European Commission Directorate-General for Research & Innovation)

A lively panel discussion followed where some of the key messages of the Forum were reiterated. Moderator **Quentin Cooper** asked each panelist to identify what they felt were the key issues which currently exist in including science and scientific evidence in policy making from implementing the UN2030 Agenda, and what measures or incentives might ensure greater cooperation and engagement. **Samantha Burgess** highlighted implementation and the political appetite for action as key issues, and called on science to challenge this, doing more to share their knowledge, excitement and concerns of the ocean with policy and public. **Seline Trevisanut** agreed that implementation is a concern, and also noted the fragmentation of both relevant sectors and governance frameworks were a key problem. UN Ocean is a great initiative for presenting an overarching ocean voice, but it excludes all other bodies at UN level with a mandate for ocean issues. **Martin Visbeck** agreed that sharing and assessment are key, and that science could do more to lay out the policy options and their subsequent impacts for required actions so that decision-makers are better able to move forward in an informed way. **Lauren Weatherdon** identified capacity and fragmentations as key aspects of the problem, stating that legal and political incentives as well as direct investment in narrowing the focus of existing laws and regulations to specific objectives and implementable actions were required. Without direct laws, there will be good will but little action. **Ivan Lopéz** warned that the will to take action is the cornerstone for progress where we already know what needs to be done, but that this can take time which can also cause frustration. However, all stakeholders must be careful to be honest about what is and is not known or understood, share expertise of both success and failure, and try to minimize conflicting scientific "evidence". **Ana Teresa Caetano** highlighted the amount of funding the European Commission invests in scientific research and wondered if the obstacles lie in making scientific evidence and recommendations reality.

"While we have the technological, human and financial capacity to strengthen the evidence base required to implement the ocean-related Sustainable Development Goals, greater coordination and communication is necessary to streamline our efforts in reaching these targets."

Lauren Weatherdon

There was a comment and a question from **Brendan Devlin (European Commission DG Energy)** noting that it can be difficult for policy makers to know which laws and regulations apply, and how they should be applied, as the landscape is very complicated. He asked whether we might see fewer and better regulations developing, and also whether a global convention on marine plastics may be appropriate? The panelists agreed that scientific understanding should come first, to then inform and influence policy and regulation rather than the other way round, and this could help ease the complexity and confusion. They also noted that more bottom-up strategies, especially for indicators, were important and science has a key role to play in these processes. **Luis Valdés (IEO, Spain)** felt that the current governance on plastics is also fragmented and hence we are not really progressing. He suggested that we could already start taking serious action with the knowledge we have, but that continued research and investment in research is key. **Ivan Conesa Alcolea (European Commission, DG RTD)** noted that plastics is viewed as such a big issue because it can be seen. There may be opportunities for greater research and action into the sources and pathways for all marine pollutants, using plastics as the "face" of the problem. He also felt that we do already know enough to act, and the next steps were to move towards more political action and a more informed general population. By educating and engaging them, they can become actors of solutions.

The issue of communication was a common thread in the discussions. **Martin Visbeck** and **Ivan Lopéz** discussed the development of marine/maritime spatial planning (MSP) as a tool for jointly developing solutions for increasing demand on ocean space and resources. Both agreed on the importance of bringing relevant sectors together to discuss the issues, with emphasis on using simple and clear communication for what are complex issues, to ensure that there are no mixed messages. **Quentin Cooper** then asked the panel whether they felt there was a need for clear guides, for example to help science to understand law and vice versa? **Seline Trevisanut** agreed that both sides should start by "speaking the same language" and also noted an ongoing question in the field about how judges and legal experts should obtain and use scientific expertise, advice, and data and evidence. Perhaps guidelines on this could also be of value. **Ana Teresa Caetano** felt that a solution could be to involve scientists in discussions from the very beginning of a policy process to avoid communication problems. **Ivan Lopéz** stated that it is much easier to change policy than to change nature, and that bottom-up approaches to policy development which involve those most affected are critical. **Lauren Weatherdon** asserted the importance of Ocean Literacy as at present, the issues can seem overcomplicated and it can be unclear what we are trying to achieve. **Martin Visbeck** agreed with the importance of social dialogues, and **Seline Trevisanut** also noted the importance of Ocean Literacy for policy- and decision-makers. **Samantha Burgess** suggested incentives for political and business leadership on these issues, and also noted that evidence comes not just from science but also from many other sources including economists, social scientists, environmentalists and traditional knowledge holders etc. There is a need to think and act as a whole system.

"We need to improve the knowledge exchange and take-up process among scientists and decision-makers if we want to succeed in meeting the targets of the 2030 Agenda on Sustainable Development in particular of SDG 14 "Conserve and sustainably use the oceans, seas and marine resources".

Ana Teresa Caetano

SESSION 3 Strengthening the evidence base for international ocean governance

COST Action: Ocean governance for sustainability: Challenges, options and the role of science

Maria Hadjimichael (University of Cyprus, Cyprus) spoke about the ongoing COST Action CA15217 of which she is a co-chair.

Maria opened her presentation by reminding the audience that the Ocean is a common heritage and whatever we decide to do, we need to ensure that we preserve it for future generations. This was the starting point and inspiration for the COST Action which has now been running for 2 years and will continue to run for a further 2 years. They are looking to move towards an integrative vision, and have three key aims: to assess priority issues for governance, to map and analyze current governance approaches, and to propose governance options which support sustainability in ocean-related decision-making.

The work will be carried out by 6 working groups which will look at a number of governance themes at different governance levels. Some examples of activities include examining ways in which scientific advice could be better taken into consideration in International Seabed Authority (ISA) activities, looking at examples of Marine Spatial Planning (MSP) implementation in states to identify key challenges, looking at research gaps in Europe in informing policy on issues such as ocean acidification, and developing training schools for early career researchers (ECR) to expand their knowledge on emerging topics such as seabed mining and MSP.

A key outcome of the project will be a greater understanding of the successes and failures of current ocean governance mechanisms.

"It is important to acknowledge that to improve something, we must first scrutinize the problematics of the existing framework and its drivers.

Maria Hadjimichael

Panel discussion

Ann-Katrien Lescraewaet (Flanders Marine Institute, Belgium), Ann Dom (Seas at Risk), Maria Hadjimichael (University of Cyprus, Cyprus), Murray Roberts (University of Edinburgh, UK), Peter Haugan (University of Bergen, Norway), John Brincat (European Commission Directorate-General for Maritime Affairs & Fisheries).

Quentin Cooper opened this discussion by asking the panel whether there are any recurring sticking points are in ocean governance. **John Brincat** highlighted the most critical which is the rejection of science itself and the growth of a post-truth era. This is something we urgently need to addressed. **Murray Roberts** proposed co-developing projects with those decision-makers and all relevant sectors of society. The fundamental model of Universities – teach, research, measure impact – works well and could be applied more widely. **Peter Haugan** noted that we should be considering all branches of science holistically, looking outside our own disciplines to move forward. The Decade of Ocean Science for Sustainability needs to be cross-cutting. **Ann Dom** referred to a letter from 15,000 scientists that was written to humanity, which did not even make front page news. What does this say about the societal image of scientists and how can we change this? She also felt that technology alone was not the solution for all of our issues, and we should be careful in considering how we proceed. **Ann-Katrien Lescrauwaet** welcomed the news on the Decade of Ocean Science for Sustainability. She reminded the attendees that science is not just for scientists, and this is something that should be taken seriously. She highlighted Citizen Science as a tool for applying this if properly managed. She also noted that in general, the role of science is to clearly communicate what is known and possible, and to demand transparency and accountability in how this evidence is used.

"It is time for scientists to reflect on their crucial role in the application of the precautionary principle, i.e. on how to bring early warnings in a manner that society and policy makers understand the urgency and the need for action."

Ann Dom

Maria Hadjimichael asked whether a body such as an IPCC for the ocean would be appropriate, which could be based on existing bodies and internationally recognized? **Peter Haugan** felt that while the ocean is big and it is not necessarily bad to have a lot of bodies to manage it, what we need to be doing now is aligning those bodies towards common goals rather than creating new ones. **John Brincat** noted that the issues are already known, and a new body will still face the same difficulties that existing ones face; what is needed is political will and real action towards implementing measures for conventions and regulations that have already been ratified. He said that the precautionary principle can be seen as the humble face of science, and that science now needs to be much clearer about what is known, and what should be factored in as knowledge develops through further research. **Ann Dom** referred to the topic of deep-sea mining. She felt that progress here can't be stopped but was very clear that we need a mechanism to include the precautionary principle and make people accountable in developing this industry, to ensure that the warnings of scientists are taken seriously. **Ann-Katrien Lescrauwaet** said that in general we have to be more precise on the SDGs and what is needed, as some of the SDG's are currently more visions than clear and implementable goals. The next step is to better define what the targets are and then look at interoperable ways to measure them, taking into account regional differences.

The moderator **Quentin Cooper** then opened the conversation to the floor for questions. **Gert Verreet (EWI, Belgium)** said that on the European scene there are so many marine strategies and asked whether there is a role for science in helping to make them robust? Changes that will be coming into research frameworks could be an opportunity to think about moving towards the co-production of science, with the problem owners and those that can put solutions on the market working together. There is an opportunity to make Europe a marine research powerhouse. **John Brincat** agreed that working together is indeed the solution to ensuring appropriate solutions and policies. **Ann-Katrien Lescrauwaet** highlighted the example of Marine Strategy Framework Directive (MSFD) implementation where experts have now moved to developing precise indicators, and through working together these will be further refined. Similar approaches are needed for wider applications. **Ann Dom** was concerned that some say there isn't sufficient data, knowledge and resources to act. **Peter Haugan** noted that Europe is heavily involve in data sharing initiatives and perhaps there are lessons that Europe could teach to other parts of the world. He noted that a mission-oriented approach is not just about funding for new science but also about looking at how existing scientific knowledge is used.

"Scientific information which remains solely within scientific circles or is understandable only by other scientists represents a wasted opportunity."

John Brincat

The discuss turned to education and training as **Samantha Burgess** questioned whether we are teaching marine scientists the right things, and whether we need to change our approaches here? **Peter Haugan** agreed that there is an opportunity here to broaden the scope of current education, but it is important to reflect on the fact that people will naturally stay within their known disciplines therefore educating scientists more generally on the needs to have a broader knowledge and skills base is also important.

Maria Hadjimichael expressed concern that University funding sources are moving away from public funding and more towards private sources of funding. She advised caution to ensure that the sources of funding do not adversely impact on the range of research that is carried out. **Ivan Lopéz** said that from his perspective as an industry representative, science is science and should always be neutral, regardless of how it is funded. **Murray Roberts** agreed that science can be neutral regardless of the funding source providing that it remains independent. **Ann Dom** agreed that it is important to support fundamental knowledge research and not always just that which is on a specific agenda.

"Fully independent and impartial science must underpin all human activities and be effectively coupled to industry, policy and civil society engagement."

Murray Roberts

Closing Session

Session 1 Rapporteur, Mark James (Marine Alliance of Science and Technology Scotland, UK) summarized the presentations in this session, highlighting the implicit links between SDG14 and the other SDG's, and the role of marine science in providing further supporting scientific understanding to inform the debate, and achieving a balance between solution- and curiosity- driven research to delivers these SDG's. He also reflected on the importance of the announcement that the UN has formally supported an International Decade of Ocean Science for Sustainability, as a huge opportunity and a challenge for the marine science community.

Session 2 Rapporteur, Gilles Lericolais (Ifremer, France) highlighted the messages that emerged from the presentations and panel discussion in this session. He particularly noted the importance of communication between all stakeholders and actors, including scientists, lawyers, industry, policy makers and society. The importance of this clear and constructive communication to promote Ocean Literacy and understanding as a means to move forward effectively was emphasized. He also noted that the speakers felt that good ocean governance structures and incentives are key, but that they must be supported by sound scientific knowledge in all its forms.

Session 3 Rapporteur, Jan-Stefan Fritz (German Marine Consortium, Germany) closed by outlining the main messages which emerged from this session's presentation and panel discussion. A key identified need was greater scientific integration through collaboration and holistic approaches, to move beyond silo-based approaches towards multi-disciplinary research and solution provision. He noted that this was seen as a key role for marine science, and crucial in the move towards greater sustainability. Another important message was the need to further effective training, and knowledge and technology transfer mechanisms at local, national and global scales.

ANNEXES

Annex I: 6th European Marine Board Forum Organization

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Forum material and presentations
Available at **http://www.marineboard.eu/6th-marine-board-forum**

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Annex II: Glossary of Acronyms

BBC	British Broadcasting Corporation
COST	European Cooperation in Science and Technology
ECR	Early Career Researcher
EMB	European Marine Board
EMODnet	European Marine Observation and Data Network
EuroGOOS	European Global Ocean Observing System
EWI	Flanders Department of Economy, Science and Innovation
GEOMAR	GEOMAR Helmholtz Centre for Ocean Research Kiel
GOSR	Global Ocean Science Report
IEO	Spanish Institute of Oceanography
Ifremer	French Research Institute for Exploitation of the Sea
IOC	Intergovernmental Oceanographic Commission
IPCC	Intergovernmental Panel on Climate Change
ISA	International Seabed Authority
MSFD	Marine Strategy Framework Directive
MSP	Marine/Maritime Spatial Planning
OECD	The Organization for Economic Co-operation and Development
SDG	Sustainable Development Goal
UN	The United Nations
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
UNEP-WCMC	United Nations Environment Programme -World Conservation Monitoring Centre
UNESCO	The United Nations Educational, Scientific and Cultural Organization
VLIZ	Flanders Marine Institute
WWF	World Wildlife Fund

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